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BPISAE RESEARCH ACTIVITIES

PLANT INDUSTRY STATION, BELTSVILLE, MD.

NOVEMBER 1948

FOR ADMINISTRATIVE USE ONLY

To employees of the
Bureau of Plant Industry,
Soils, and Agricultural Engineering

Many of you have expressed an interest in some method of keeping informed on the Bureau's research and related activities in fields other than your own. An administrative letter appears to be the most satisfactory answer to this problem and with this in mind, we are inaugurating BPISAE RESEARCH ACTIVITIES.

The material deals briefly with new projects, research findings, major personnel changes, administrative actions, and publications. In subsequent issues, with your cooperation, we will also use items of interest from the field.

You can help make the letter more useful to your colleagues by reporting appropriate items on your work to your Division representative (see page 20). We shall appreciate your comments and suggestions.

Sincerely yours,

Robert M. Salter

Chief of Bureau



 * REPORTS ON NEW PROJECTS AND RECENT FINDINGS *

Seed Bank of Improved Legume and Grass Varieties .

Foundation seed stocks of superior legume and grass varieties will be increased, stock-piled, and distributed under an RMA project recently set up to meet the growing, country-wide demand for high-quality certified seed of these crops.

The Division of Forage Crops and Diseases will direct the program and work in cooperation with State agricultural experiment stations and crop improvement associations in both seed-producing and seed-using areas. One field office will be set up in the East and another in the West to handle the project.

The Commodity Credit Corporation will contract growers through the State experiment stations for the production of seed. The growers, in turn, will obtain foundation seed of newly introduced superior varieties from the stations or in the case of established varieties from private producers. The State will supervise the production and certify seed that meets foundation seed requirements. This will be bought by the CCC for stock-piling and resale to other foundation seed growers. A committee composed of representatives of the Department, the State experiment stations, the International Crop Improvement Association, and the seed industry will allot the supply to various sections of the country for seed production.

Alfalfa, red clover, crimson clover, and Sudan grass will be increased in the beginning. The program will be expanded to include stocks of other superior legume and grass varieties after it gets under way.

Plant Disease Forecast

The occurrence of late blight is under study along four fronts in the Crop Plant Disease Forecasting project. These are (1) field studies on the relation of weather and microclimate to disease development; (2) the importance of spore showers in late blight spread; (3) the extent and distance to which spores are air-borne; and (4) the existence of specialized host strains of Phytophthora infestans.

Established with RMA funds, the project involves all factors in the predictions of plant disease occurrence. Under it, a warning service as far west as the Plain States is now conducted for late blight, tobacco, blue mold, and cucurbit downy mildew.

Dr. Paul R. Miller, of the Division of Mycology and Disease Survey, is in charge of the work. Regional offices have been set up with Russell A. Hyre stationed at Newark, Del., Lee H. Person, at Raleigh, N. C., and Jack R. Wallen, at Ames, Iowa. Muriel J. O'Brien is assistant to Dr. Miller in the project at Plant Industry Station.

Irrigation and Soil Management Studies Get Under Way

Investigations to determine the mineral requirements of alfalfa under varying soil and moisture conditions in the West are the first of a series of experiments being inaugurated under an RMA project.

The work is being done cooperatively by the Divisions of Soil Management and Irrigation and Forage Crops and Diseases, the Regional Salinity and Rubidoux Laboratories, the Soil Conservation Service, and the State agricultural experiment stations in the West.

General objective is to establish and evaluate basic relationships between water, soil, and plants and to develop methods of water use and management for the improvement of land and water resources.

The experiments with alfalfa will include studies of the effects of varying soil and moisture conditions on the rates of plant nutrient uptake, dry matter production, seed, and nutritive quality. They will involve rate, placement, and time of fertilization in relation to irrigation practices and crop rotation.

A field laboratory unit is being developed to study and diagnose saline and alkali soil problems in the field. The unit will consist of a station wagon equipped with instruments for salinity appraisal. It will be used to conduct tests on pH, conductivity of soil paste, extraction of soil solution, "quick tests" for exchangeable base status, and the important soluble salts and ions, permeability, infiltration, and ground-water levels and gradients.

Dr. F. O. Kelly is project leader for the experiments with alfalfa, and headquarters are at Fort Collins, Calif. Dr. H. E. Hayward, director of the U. S. Regional Soil Salinity Laboratory at Riverside, Calif., is in charge of the project for developing and applying techniques for the field diagnosis of saline and alkali soil problems.

Grand Forks Headquarters for New Potato Project

An RMA project to develop improved methods of harvesting, handling, storing, and shipping potatoes is being started in the Red River Valley of North Dakota and Minnesota. Dr. J. M. Lutz, senior physiologist, now superintendent of the field station at Meridian, Miss., will be in charge of horticultural phases of the study, with headquarters at Grand Forks, N. Dak. A. H. Graves, associate agricultural engineer at the Bureau's Toledo (Ohio) laboratory, has been assigned to handle the machinery research.

The work will be conducted in cooperation with PMA, BAE, the North Dakota and Minnesota Agricultural Experiment Stations, and the Red River Valley Potato Growers Association. The association is constructing three new buildings especially for the project--a large storage and handling laboratory, a shop for machinery research, and an office building with laboratory facilities for physiological and pathological investigations and cooking tests.

Objective--Multiple Resistance

The common bean mosaic and the new unnamed virus New York 15 are getting special attention in an RMA project set up to increase seed production of dry and snap beans, peas, and other vegetables through breeding for multiple resistance to disease and insect damage. Breeding lines from new crosses made a year ago have already been supplied to certain cooperating agencies.

Dr. W. J. Zaumeyer is in charge of the project, which is cooperative in the East with the Michigan and Cornell Agricultural Experiment Stations and in the West with the experiment stations of Nebraska, Colorado, New Mexico, Wyoming, Montana, Idaho, Washington, and Oregon. Field offices are being established at East Lansing, Mich., with Dr. Axel Anderson in charge, and at Twin Falls, Idaho, where a Bureau representative will be named.

Heat Pump Project

The Farm Electrification Division has joined the Kansas State Agricultural Experiment Station in a cooperative research project on the heat pump. The Kansas Committee on the Relation of Electricity to Agriculture, which sponsored preliminary studies of the reverse-cycle refrigeration principle, is also actively interested in the new project. Warren C. Trent will devote full time to the heat pump work with headquarters at Kansas State College, Manhattan. Tentative plans call for the study of problems connected with the use of the ground as a source of heat and as a heat sink. Attempts will be made to determine the actual heat transfer coefficients for different types of soil under various moisture conditions.

Plant Hormone Study

Pollen from various kinds of plants offers the richest source of true plant hormones. Sizeable quantities of various pollens have been collected for the isolation of growth-regulating substances in an RMA project conducted jointly by this Bureau and BAIC. Dr. John W. Mitchell and Miss Dorothy P. Skaggs, of the Division of Fruit and Vegetable Crops and Diseases, are working with Dr. Thomas D. Fontaine, BAIC, to isolate, identify, and synthesize growth-regulating substances that occur in plants.

Rice Drying and Storage

A review and analysis of the literature on rice drying and storage has been prepared by Harold A. Kramer of the Division of Farm Buildings and Rural Housing. Multilithed, the publication is designed for use by rice growers and drier operators and as a guide in planning research. It also contains information in question and answer form on combining rice for drying, operation of driers, handling partly dried rice, changes in quality after drying, loss of weight in drying, moisture tests, drying rice for seed, and safety and dust control.

Grazing Research Points to Improved Ranges

More than 3,000 farmers and ranchers from Oklahoma, Texas, Kansas, Colorado, and New Mexico attended the Range Improvement Field Day at the Southern Great Plains Field Station, Woodward, Okla., October 9.

Dr. O. S. Aamodt, head of the Division of Forage Crops and Diseases, Dr. T. C. Byerly of the Bureau of Animal Industry, Dr. L. E. Hawkins, vice-director of the Oklahoma Experiment Station, and Charles Gardener, president of the Northwest Cattlemen's Association spoke on the program arranged by Supt. David A. Savage and his coworkers at the Station. The program included a 20-mile tour of the experimental ranges. Some research findings reported are:

(1) Sand sagebrush and many range weeds can be effectively controlled by one application of 2,4-D by airplane. The chemical has been much more effective, cheaper, and easier to use than a mower, and has little harmful effects on range grasses. It does not injure any class of livestock.

(2) Continuous moderate grazing has proved superior to rotational grazing at monthly intervals either in a two-divisional or three-divisional system. Deferment of grazing during the entire growing season is, however, proving beneficial to the vigor and production of vegetation, particularly on ranges treated with 2,4-D.

(3) The beef-producing qualities of sand lovegrass have been superior to those of any other grass or grass mixture used. A reseeded mixture of blue grama, side-oats grama, western wheatgrass, and Texas bluegrass--combining warm and cool season grasses--gave excellent results in comparison with other native and reseeded pastures. A pasture of reseeded buffalo grass produced less gain per head but supported more than twice as many cattle and yielded twice as much gain per acre.

Mr. Savage, the new superintendent of the station, assumed his duties in July. A native of Montana and a graduate of Montana State College, he has conducted forage and range research for the Department for 24 years, the past 10 years at Woodward. He succeeds Lowell F. Locke, who will devote his time to crop rotations and other soil studies.

Malting Barley Laboratory

Land has been acquired on the agronomy farm of the University of Wisconsin and building operations started on the new laboratory and pilot plant facilities to develop improved techniques for malting barley.

It is expected that the construction of the building and installation of equipment will require nearly a full year. This RMA project also provides for the evaluation of barley qualities for malting.

New Source of Nitrogen for Tung Trees

Anhydrous ammonia offers promise as a cheaper source of nitrogen for tung trees than the ammonium nitrate now widely used, preliminary results of a study now in progress by the Division of Fruit and Vegetable Crops and Diseases show.

Heavy fertilization of tung trees with nitrogen increases the yield and the oil content of nuts rather consistently. Many growers now apply from 1/2 to 2-1/2 pounds of actual nitrogen to each mature-bearing tung tree. Nitrogen in the form of anhydrous ammonia costs only about 60 percent as much as in the form of ammonium nitrate, and it is on the market in greater supply.

When a preliminary test showed that anhydrous ammonia did not harm the trees, the Division set up an experiment in a large commercial orchard to determine the effectiveness of the two forms of nitrogen at two levels of application and with two forms of potash. The effect on production will not be evident until 1949, but throughout the summer of 1948 the trees fertilized with anhydrous ammonia made vigorous growth, carried a dark-green, healthy foliage, and appeared equal in all respects to the trees fertilized with ammonium nitrate.

Hops Study Reorganized

Research in the breeding and culture of hops in Washington, Oregon, and California has been reorganized and expanded by the Division of Tobacco, Medicinal, and Special Crops. Dr. Kenneth Keller, formerly of Iowa State College, is in charge of the project, with headquarters at Corvallis, Oreg.

The program is primarily one of plant breeding to develop varieties resistant to downy mildew, which is a serious disease of the crop. At the same time an effort will be made to develop superior varieties from the standpoint of yield and brewing value. Another phase of the work will deal with practical measures for the control of diseases in the hop fields.

Soil Surveys in the Making

Basic soil surveys have been started within the past year and a half in 20 counties. They are: Hartford (Conn.), Lawrence, Menard, and Will (Ill.), Ontonagon (Mich.), Fillmore (Minn.), Coahoma and Sunflower (Miss.), Boone (Mo.), Franklin (N. Y.), Fairfield (Ohio), Pawnee (Okla.), Douglas (Oreg.), Bradley, Houston, Marion, and Maury (Tenn.), Brazos (Tex.), Skagit (Wash.), and Richland (Wis.)

Farm Freezers Studied

Present refrigeration facilities on the farm, particularly the home-made, walk-in type freezer-locker, are under study in a project conducted jointly by the Farm Electrification Division and the Housing and Household Equipment Division of BHNHE. Harry Garver is working with Dr. Earl McCracken to make a survey of about 150 farms.

Spraying Rice with 2,4-D

Under Texas conditions rice fields in mixed cotton-rice areas may be sprayed with 2,4-D from aircraft with reasonable safety by trained and competent pilots in mixed cotton-rice areas when all of the following conditions prevail:

- (1) Only nonvaporizing forms of 2,4-D are used.
- (2) The wind velocity does not exceed 5 miles per hour.
- (3) The spray is discharged at elevations not greater than 10 feet.
- (4) Cottonfields are at least a half-mile away from the area to be sprayed.
- (5) The equipment used is operating properly. Faulty equipment may nullify all safety precautions and result in damage from accidental discharge while turning or flying over sensitive crops.

These are the findings from experiments undertaken this past summer at Beaumont, Tex., in cooperation with the Texas Agricultural Experiment Station. The tests were designed to determine whether 2,4-D may be used safely on rice fields in areas where cotton is grown also.

Dye Shows Dusting Performance

A technique for evaluating the performance of airplane dusting equipment has been developed by agricultural engineers working at the Pest and Plant Disease Control Machinery Laboratory in Toledo, Ohio. They use dyed dust, and then make color determinations of the deposit to measure the performance of an aerial duster accurately and in a relatively short time.

The new technique is of special value in gaging the rate at which the greatly increased volume of dust needed in each second of operation is fed to the distributing mechanism. The flow must be steady and evenly adjusted or the dusting will be spotty and ineffective.

Citrus Storage

Cold storage of citrus fruit for off-season marketing will be studied in an RMA project now getting under way in the Division of Fruit and Vegetable Crops and Diseases. The Refrigeration Research Foundation is cooperating in the work that will be conducted in Florida by Dr. P. L. Harding, in Texas by A. L. Ryall, and in New York City by Dr. J. S. Wiant.

Sugar in Harvested Cane

Preliminary results of an RMA project to develop practices for maintaining the sugar content of harvested cane show that less sugar is lost in cane burned to remove leaves and trash than in unburned, hand-stripped cane. Dr. J. I. Lauritzen and Robert E. Coleman are project leaders in the work at the U. S. Sugar Plant Field Station, Houma, La.

Sorghum for Industrial Use

Construction of two commercial plants in the Southwest to use grain sorghum for industrial purposes is viewed by Bureau sorghum breeders as an extremely important development.

A plant at Corpus Christi, Tex., will use 6 million bushels annually in the manufacture of starch and dextrose. A dry milling plant at Dodge City, Kans., will produce sorghum grits for brewing and distilling and manufacture oil and polishing wax as byproducts.

Because it offers high resistance to drought, diseases, and insects, sorghum has replaced corn as grain in much of the Southwest. The prospect that superior varieties for industrial use would offer an expanded market has led the Bureau to develop a number of lines for this purpose. Some of these are expected to be ready for introduction within the next year.

Mushroom Studies Resumed

Mushroom investigations have been reestablished in the Division of Fruit and Vegetable Crops and Diseases, with Dr. Edmund B. Lambert in charge. Formerly with the Division of Mycology and Disease Survey, Dr. Lambert joined the staff of one of the producers of antibiotics in 1943 when the Bureau's mushroom studies were discontinued because of the war. He was in commercial mushroom work from 1945 to 1948.

Pole Blight Disease of Western Pine

The Division of Forest Pathology has started investigations on the pole blight disease of western pine in Idaho, western Montana, and eastern Washington. This disease kills trees of pole size. The cause is unknown. Dr. Lake S. Gill, of the Division's field laboratory at Albuquerque, N. Mex., is in charge of the study.

Program on Plant Disease

The Plant Disease Survey Conference and the Plant Disease Prevention Committee will hold joint discussions at the Pittsburgh meeting of the American Phytopathological Society. Topics scheduled include means of preventing the introduction of new pathogens, methods of detecting new introductions, and organization of an information service on certain epidemic diseases.

Nematodes May Cause Sweet Potatoes to Crack

Soil treatment with chemicals designed to control nematodes virtually eliminated a hitherto unexplained cracking of sweet potato roots. The finding needs further testing, but it is of special interest in pointing to an unsuspected cause of the trouble.

Machines for Small-Scale Processing Studied

To speed up work in small-scale freezing and canning plants, agricultural engineers of the Bureau and of the University of Georgia have adapted a sheller designed for dry beans and peas for use with green beans and peas. The sheller handles 300 to 400 pounds of beans an hour in comparison with 10 pounds an hour, which a worker can shell by hand.

Other machinery for small-scale processing of fruits and vegetables in community canneries and freezer-locker plants, tested and developed in the cooperative study, was demonstrated at various points throughout the State, this past summer.

Equipment for processing poultry and meat at locker plants is now being tested and developed. W. H. Hurst of the Division of Mechanical Processing of Farm Products is in charge of the study.

Nematology Sets Up Three Field Stations

Investigations on nematodes as limiting factors in crop production are in progress at three field stations under RMA projects. At Sanford, Fla., Dr. J. R. Christie is directing the study of nematodes in relationship to dieback and slow decline in citrus plantings, the significance of weeds in plant nematode problems, and the role of legumes and their relationship to nematodes. He is also working on the control of nematodes injurious to vegetable crops. Except for this last phase, similar studies are under way at Sacaton, Ariz., under the direction of Dr. Harold W. Reynolds. Dr. F. J. Spruyt is in charge of the work at Hicksville, N. Y., on the control of the golden nematode of potatoes.

Seedsmen Furnish Seed for Project

The generous cooperation of commercial seed producers in the West and South is making it possible for the Bureau to conduct a fairly comprehensive study of factors affecting the viability and longevity of seed beans and lupine seed. Dr. E. H. Toole of the Division of Fruit and Vegetable Crops and Diseases and Roland McKee and Paul R. Henson of the Division of Forage Crops and Diseases are directing the study in the vegetable seed research laboratory at Beltsville. This is a part of a broad project in which the Divisions of Agricultural Engineering are cooperating to develop improved methods, equipment, and structures for drying and conditioning grain, seeds, and feeds.

Buckwheats High in Rutin

Buckwheat has assumed an importance in the field of medicine since the discovery that it is an important source of rutin. This is a product used to treat capillary fragility, a condition which often results in what is commonly referred to as a "stroke."

Two new buckwheat strains developed at Beltsville promise increased yields of rutin. One is a tetraploid variation of the small-seeded, or tartary, type. The other is a strain from the less common buckwheat type, *emarginatum*.

Sioux, A New Strawberry

The Sioux strawberry, a new variety developed by Dr. LeRoy Powers of the Cheyenne Horticultural Field Station, has been released for propagation. The new berry comes from a cross between Fairfax and a native Rocky Mountain strawberry and the progeny backcrossed to Fairfax.

Sioux has proved to be fully winter-hardy without protection, tolerant of drought and soil alkalinity, and quite resistant to leaf spot and a certain type of root disease. The fruit characters are good to excellent, except the flesh is probably not firm enough for a shipping variety. Sioux is recommended for home use and local markets in central and western Nebraska and Kansas and for trial in Wyoming, Colorado, and Iowa.

Victoria Oats Replaced

In all areas in which Victoria blight has become the chief limiting factor in oat production, Victoria-related oats are rapidly being replaced by resistant varieties. Seed of Clinton, Benton, Mohawk, and similar Bond-derived varieties have been widely distributed and are being extensively grown in the North Central and Northeastern regions. About 90 percent of the 1948 oat acreage in Iowa, Illinois, and Indiana was sown to oats of this type. In Minnesota the locally developed Mindo and Bonda varieties with Clinton almost completely replaced Tama and Vicland. In the lower South, however, a lack of resistant varieties has resulted in a marked shift to the old, long popular Red Rustproof variety.

Seek to Improve Guayule and Kok-Saghyz

Research in domestic rubber production is concerned with breeding and testing new high-yielding strains of guayule and kok-saghyz and the improvement of techniques in producing these crops. A series of wild types of guayule has been obtained in Mexico, and plant explorers in the Near East are seeking new dandelion types for use in improving kok-saghyz. The breeding and production research is in progress at Winter Haven, Tex., Corvallis, Oreg., and Salinas and Pasadena, Calif. Stanford University is cooperating in the study at Pasadena.

New Ginning Laboratory in New Mexico

Work has begun on construction of the \$190,000 Southwest Branch U. S. Cotton Ginning Laboratory on the campus of the College of Agriculture, Mesilla Park, N. Mex. The Division of Mechanical Processing of Farm Products and the Cotton Branch, PMA, will equip the building for studies of fiber production problems peculiar to the Southwest.

Rubber Research in Mexico

Mexico is making progress in adopting effective measures for combatting South American leaf blight. This and other phases of the cooperative rubber research program were discussed in August when Bureau representatives conferred with the Minister of Agriculture in Mexico City. Attending the conferences were Dr. Michael H. Langford, Beltsville, and Dr. T. D. Mallory, Raymond E. Stadelman, and August M. Gorenz, of the Rubber Division staff in Mexico City.

World Soils and Food

The world problem of feeding an increasing population is not so much a matter of productive soils as it is of developing social institutions to put the soils into production, Dr. Charles E. Kellogg, head of the Division of Soil Survey, told the American Farm Economic Association at Green Lake, Wis., September 10.

Dr. Kellogg said potential new land and increased production on land now farmed can give us food significantly beyond that needed for the estimated world population of 1960. He estimates 1,300,000,000 acres of unused land can be developed for crop production. A billion of these acres are in the Tropics, in Africa, South America, and on the large tropical islands. The rest lies between the temperate regions and the tundra of the frigid zones.

From the physical and biological standpoint, without new soils the food needs of the world could be met for cereals, roots and tubers, and sugar through technology on land now in production. New soils or further increases in yields beyond those estimated would be needed to supply a bit more fats and oils, and much more beans, peas, and nuts, fruits and vegetables, meat and milk.

Taxonomic Revision of Lonchocarpus

The genus Lonchocarpus, a group of about 150 species of tropical, leguminous plants that are an important source of rotenone, is the subject of a taxonomic revision now under way. Dr. Frederick J. Hermann of the Division of Plant Exploration and Introduction is making the revision. He has almost completed the realinement of Mexican and Central American species and has begun work on the species of South America.

New Lotus Strains Studied

A lotus-breeding program to meet the need for adapted high-producing strains for various regions is being conducted by Roland McKee and Paul Henson in cooperation with State experiment station workers. They are making selections of the botanical subspecies of the two lotus species now grown commercially and testing them in various locations. Field offices have been set up at Columbia, Mo., and Raleigh, N. C.

To Breed Sawfly-Resistant Wheats

RMA funds have recently been allocated for a project to develop improved sawfly-resistant varieties of wheat and to investigate better cultural practices and insecticidal measures for the control of wheat stem sawfly. The Division of Cereal Crops and Diseases will conduct the research in cooperation with the Bureau of Entomology and Plant Quarantine in North Dakota and Montana.

Apple Storage Project Resumed

Work on the improvement of design and operation of cold storages for apples has been resumed at Wenatchee, Wash., by the Division of Farm Buildings and Rural Housing, the Division of Fruit and Vegetable Crops and Diseases, PMA, and the Washington Experiment Station. George F. Sainsbury, refrigeration engineer, is in charge of the investigations.

Produce at Terminal Markets

Two new projects dealing with the handling of fresh fruits and vegetables in terminal markets have been inaugurated by the Division of Fruit and Vegetable Crops and Diseases with RMA funds. Most of the work will be done in the Market Pathology Laboratory in New York City under the direction of Dr. J. S. Wiant and by a group at Plant Industry Station headed by W. E. Lewis.

Mycological Collections

Recent additions to the Bureau's collections include the herbarium of George L. Zundel and the fungus collections of W. H. Long. The herbarium is composed of a comprehensive series of specimens of the Ustilaginales (smut fungi) of the world. The Long collection, which was willed to the Smithsonian Institution, is deposited at Beltsville under a cooperative agreement.

ON THE CALENDAR

Nov. 30-Dec. 3	International Crop Improvement Association, Kansas City, Mo.
Dec. 6-8	American Phytopathological Society 40th Annual Meeting Pittsburgh, Pa.
Dec. 8-10	North Central Weed Control Conference Springfield, Ill.
Dec. 13-15	American Society of Agricultural Engineers Stevens Hotel Chicago, Ill.
Jan. 31-Feb. 1	Southern Agricultural Workers Conference Baton Rouge, La.

Tune In

A 14-minute program on the Bureau's research in breeding edible tree nuts and recent developments in disease control of nut trees is scheduled for broadcast on the American Farmer show of the ABC network, December 18 at 12:30 EST.

 * NOTES ON PERSONNEL *

Cardon Again Heads ARA

Dr. P. V. Cardon returned to the Agricultural Research Administration as administrator, August 18. He succeeds Dr. W. V. Lambert, who resigned to become dean of the Nebraska College of Agriculture and director of the experiment station. At the same time, Dr. Byron T. Shaw was named deputy administrator of ARA and given responsibility for many of the day-to-day operations of the organizations.

Both Dr. Cardon and Dr. Shaw have served in this Bureau. Dr. Cardon's work began in 1909. His experience includes 8 years in dry-land investigations in the West and agronomic studies in the Cotton Belt; a period as professor of agronomy and director of the State seed laboratory in Montana; 3 years as farm economist and 7 years as director of the Utah Agricultural Experiment Station. He re-entered the Bureau in 1935 as head of the Division of Forage Crops and Diseases. He served as assistant chief of the Bureau until 1942 when he was made assistant administrator of the ARA. He was appointed administrator in 1945. Two years ago when a temporary health condition made it inadvisable for Dr. Cardon to carry on the work of administrator, he returned to the Bureau as special assistant to the Chief.

Dr. Shaw entered the Bureau in 1943 to direct research in soils physics. Later he was in charge of investigations on soil management and irrigation. For the past 2 years as assistant administrator of research in ARA, Dr. Shaw has been responsible for the over-all planning and coordination of production research.

Magruder to RMA

Dr. Roy Magruder, principal horticulturist in vegetable investigations at Beltsville, left the Bureau September 30 to become assistant to the Administrator of the Research and Marketing Act. Dr. Magruder's responsibility will have to do with RMA projects on fruits and vegetables and tree nuts. He will work closely with the RMA committees established under the Act to represent producers and industry on citrus, deciduous fruit, vegetables, potatoes, and tree nuts. He succeeds Dr. Cyril O. Bratley, who died May 9 of this year.

Except for a short period during World War II with the War Food Administration, Dr. Magruder has been on the research staff of the Division of Fruit and Vegetable Crops and Diseases. From 1923 to 1931 he was assistant horticulturist at the Ohio State Agricultural Experiment Station, where he conducted crop improvement work on vegetables.

Rands Heads Rubber Research

Dr. Robert D. Rands, new head of the Division of Rubber Plant Investigations, is a plant pathologist. He joined the Department in 1917 shortly after receiving his Ph.D. from the University of Wisconsin and has remained in the Bureau since, except for 3 years from 1919 to 1921 when he served as botanist for the Netherlands Government in Java.

His research includes the diseases of the Irish potato, cinnamon, sugarcane, and para rubber. His article, "Hevea Rubber Culture in Latin America, Its Problems and Procedures," published in 1942, was widely used during the war when a rubber culture program was established in Latin America.

Dr. Rands succeeds Dr. E. W. Brandes, who asked to be relieved of the duties and permitted to devote his full time to the work of the Division of Sugar Plant Investigations.

Long, New Assistant in Agricultural Engineering

J. Dewey Long has been appointed special assistant to Arthur W. Turner, head of the Divisions of Agricultural Engineering. He will aid in developing and coordinating the research of the Divisions, including work cooperative with the States and with industry.

A native of Iowa and a graduate of Iowa State College in agricultural engineering, he was on the staff of the University of California, at Davis, until 1940, when he joined the Douglas Fir Plywood Association at Tacoma, Wash. In 1947, he went with a mission from the Office of the Foreign Agricultural Relations to Bogota, Colombia.

Mr. Long is the author of several books and publications on farm buildings and on the processing of farm products. He is past president of the American Society of Agricultural Engineers.

Kerr Named Leader

Dr. Thomas Kerr has been named leader of investigations on structural, physical, and chemical properties of fibers in connection with plant breeding and other production operations. He will direct the work from the Beltsville laboratories of the Division of Cotton and Other Fiber Crops and Diseases. Dr. Kerr received his Ph.D. from Pennsylvania and held a National Research Council fellowship in botany at the Bussey Institute of Harvard before entering the Bureau in 1936. For the past 12 years he has served as cytologist and fiber technologist in cotton research at Raleigh, N. C.

Stuart Returns from England

During the past summer, Dr. Neil W. Stuart of the floricultural and ornamental section spent 3 months in England as a member of the Scientific Office of the American Embassy. While there he visited government experiment stations and most of the universities in both England and Scotland.

Spray Saved Wheat from Weeds

A large measure of credit for saving the bumper 1948 Kansas wheat crop goes to F. L. Timmons, now regional weed research coordinator for the 13 western States with headquarters at Logan, Utah.

Last January, while Mr. Timmons was still in charge of weed control investigations at the Kansas Agricultural Experiment Station at Fort Hays, he predicted that the rain needed to produce a wheat crop would also bring a heavy infestation of weeds. He advised growers to spray their fields with 2,4-D.

On the basis of this advice, the head of an air service in Fort Hays bought equipment and supplies enough to spray several hundred thousand acres. When the rains came and heavy growth of weeds threatened the thin stands of wheat, growers took Mr. Timmons' advice. They contracted with the Fort Hays air service and with others for the spraying of more than 500,000 acres of wheat. Killing the weeds saved the crop.

At the 10th annual Kansas State Weed Conference, Mr. Timmons' colleagues presented him with a wrist watch in recognition of his 10 years of research at the Fort Hays (Kans.) station, and in honor of his transfer to the post of regional coordinator. The official methods of weed control adopted by Kansas are based on Mr. Timmons' findings.

Award to Ensweller

Dr. S. L. Ensweller, in charge of floricultural and ornamental investigations, won the annual Leonard H. Vaughan Memorial Research Award of \$500 for his article, "The Utilization of Induced Polyploidy in Easter Lily Breeding", (Amer. Soc. Hort. Sci. Proc. 49:379-84). In this article he reported the introduction of autotetraploids in Easter lilies. His cytological study showed the occurrence of aneuploids in which from 1 to 3 chromosomes were missing. In one case an extra chromosome was present. Some of these new tetraploid lilies are of fine quality and will probably be useful for garden culture and greenhouse forcing.

French Visitor

M. Georges Aubert, in charge of soils research in the French Ministry of Colonies, is working with the Division of Soil Survey on the world soil map project during a 3-months' stay in America. He is also serving as a consultant to the Food and Agricultural Organization of the United Nations on soil problems and is traveling in eastern and southern United States and eastern Canada. He spoke on the soils of France and her colonies before a seminar at Plant Industry Station, October 14.

Nixon in Algeria

Roy W. Nixon of the USDA Date Garden, Indio, Calif., is spending 6 months in the study of date production in Algeria and adjacent territory under a grant from the Guggenheim Foundation.

Gunning Returns to Bureau Staff

Harry A. Gunning has returned to the Bureau as superintendent of construction and development at the National Arboretum. A graduate of Kansas State College, he first joined the Bureau in 1919 at Bard, Calif. He was associate horticulturist in charge of the Plant Introduction Garden at Glenn Dale, Md., from 1927 until 1936, when he transferred to the Soil Conservation Service. Mr. Gunning will work with Acting Director B. Y. Morrison in planning a program for developing the Arboretum.

Yarnell Heads Laboratory

Dr. Sidney H. Yarnell is the new superintendent of the Regional Vegetable Breeding Laboratory, Charleston, S. C. A member of the staff since June 1947, he succeeds Dr. B. L. Wade, who resigned in August to become chairman of the department of horticulture at the University of Illinois. Prior to coming to the Bureau, Dr. Yarnell served 16 years as head of the department of horticulture at the Texas State Experiment Station.

Text by Turner

Arthur W. Turner, assistant Chief of the Bureau in charge of agricultural engineering, is co-author of a new textbook, "Machines for the Farm, Ranch, and Plantation." Published in the McGraw-Hill Rural Activities Series, the book is copiously illustrated. It deals, on a job-activity basis, with all machines used in producing crops grown in the United States and Canada. Elmer J. Johnson of the U. S. Office of Education is the other author.

Darrow New ASHS President

Dr. George M. Darrow, in charge of deciduous fruit investigations, was elected president of the American Society for Horticultural Science at the recent Cincinnati meeting. The Society will meet next year in Milwaukee, the latter part of October.

Honorary Curator of Smithsonian

John A. Stevenson, head of the Division of Mycology and Disease Survey, has been appointed honorary curator of fungi in the Department of Botany, Smithsonian Institution.

Award to Brandes

Dr. E. W. Brandes, head of the Division of Sugar Plant Investigations, recently received the alumni award for distinguished service from Michigan State University.

Snyder to South America

Elmer Snyder, who conducts grape investigations at Fresno, Calif., is planning a 6-weeks trip visiting vineyards in South America.

RETIREMENTS

Dr. Joseph S. Caldwell, senior physiologist, Division of Fruit and Vegetable Crops and Diseases, October 30, with almost 31 years of service.

A native of Tennessee, Dr. Caldwell is a graduate of Maryville College and the University of Chicago. Before coming to the Bureau, he taught at Peabody College for Teachers and at Alabama Polytechnic Institute. He was plant physiologist at the Washington Agricultural Experiment Station for 2 years.

Dr. Caldwell joined the Bureau in December 1917 as a specialist in drying vegetables. During his years of service here he has made valuable contributions to the knowledge of the behavior of fruits and vegetables in canning, drying, and in the manufacture of unfermented juices. Dr. W. V. Lambert, ARA administrator, cited the work of Dr. Caldwell's unit during the war as superior and far in excess of the line of duty. In recognition of this wartime research in the dehydration of fruits and vegetables, Maryville College recently awarded Dr. Caldwell an honorary doctorate of science.

He is the author or co-author of 103 technical articles and bulletins on the determination of factors of quality and on the preservation of fruits and vegetables. He will continue the research as a collaborator.

Dr. Perley Spaulding, principal pathologist in charge of the Forest Pathology field laboratory at New Haven, Conn., September 30. He will continue special lines of work as a collaborator. Dr. Spaulding is well known for his publications on forest tree diseases and their control. His early fundamental work on white pine blister rust established the basis for the present control program.

Dr. Spaulding was an official delegate to the International Institute of Agriculture in Rome, Italy, in 1920. He served as editor-in-chief of Phytopathology from 1921 to 1924. In 1948 he received a USDA Distinguished Service Award for his unusually productive research and outstanding contribution to the science of forest pathology and its application to forest management practices in the United States.

Dr. J. R. Hansbrough succeeds Dr. Spaulding as head of the New Haven laboratory, which is maintained in cooperation with Yale University.

William Hannold Cheesman, technical editor, Division of Information, September 10. Mr. Cheesman's service with the Bureau began in 1942 after 29 years as editor-in-chief of the Bureau of Biological Survey of USDA and its successor organization, the Fish and Wildlife Service of the Department of the Interior. His editorial work has covered hundreds of Farmers' Bulletins, Circulars, Leaflets, reports and technical papers during a period of great growth in the research activities of the Department of Agriculture.

Paul D. Olejar succeeds Mr. Cheesman. Mr. Olejar comes to BPISAE from the Bureau of Reclamation, Department of the Interior.

Ludwig S. Mayer, agronomist, Division of Cereal Crops and Diseases, September 30, with 30 years of service. From 1923 until 1941, he was in charge of the cooperative corn improvement work at the University of Tennessee and during that time he developed four inbred lines from the open-pollinated variety, Neal Paymaster, which went into Tennessee Hybrid 10, one of the first corn hybrids put out commercially in the South and now widely grown.

Nellie G. Bulger, editorial clerk, Division of Information, October 30, after 30 years of service.

Thornton O. Crown, photographer, Division of Soil Survey, July 31, after 29 years of service.

Elizabeth C. Lambert, administrative assistant in charge of fiscal affairs, Division of Cereal Crops and Diseases, September 30, after 34 years of service.

Ellen M. Quirk, editorial clerk, Division of Sugar Plant Investigations, July 31, after 32 years of service.

Anna C. Rider, clerk-stenographer, Division of Fruit and Vegetable Crops and Diseases, October 30, after 31 years of service.

DEATHS

Sidney G. Brain, assistant to the leader of the cooperative cotton breeding genetics program at Stoneville, Miss., September 29. Mr. Brain, a graduate of the University of Arkansas, joined the Division of Cotton and Other Fiber Crops and Diseases in 1935. With the exception of a year and a half in Washington, D. C., and a few months in Arkansas, his service was at Stoneville, where he made an excellent record.

Dr. Otis A. Pope of the Office of Foreign Agricultural Relations, September 28. Dr. Pope was employed in the Division of Cotton and Other Fiber Crops and Diseases from 1935 to 1945. He was well known as an authority on the statistical phases of the conduct and interpretation of research work.

J. Marion Shull, associate botanist, retired, at Chevy Chase, Md., September 3. Mr. Shull served as botanical artist in the Bureau from 1909 until 1925. For the next 17 years he was associate botanist. He retired in 1942. Among his numerous awards for excellence in botanical research and plant development were the Silver Medal and the Distinguished Service Medal of the American Iris Society.

* ADMINISTRATIVE NOTES *

Efficiency Rating Boards of Review

The Department is establishing Efficiency Rating Boards of Review in each of the Civil Service regions to hear appeals of employees in the field service. The Board in Washington will be retained and its jurisdiction extended to cover employees at Beltsville.

Each Board will consist of a chairman appointed by the Civil Service Commission, a member named by the Department, and a representative elected by employees. Field employees will have an opportunity to vote on a representative at an early date, if they have not already done so. It is expected that instructions governing appeals under the new system will be issued soon after the Boards are established.

Until the Boards are set up, employees will continue the present practice in filing appeals. The new procedure will not affect the current provision for appealing to the Bureau Efficiency Rating Committee before making formal appeal to the Board of Review. Beginning November 1, 1948, Civil Service requires that an appeal must be filed within 30 days after the rating is received instead of the 90 days formerly allowed.

Federal Income Tax

The Revenue Act of 1948 provides for additional credits against 1948 income. The new Withholding Exemption Certificate (Form W-4) provides allowance for these credits, with final adjustment when you submit 1948 returns. Briefly, they are:

1. Exemptions raised from \$500 to \$600 for the taxpayer and for each dependent whose income for the taxable year is less than \$500.
2. An additional exemption of \$600 for the taxpayer if he has attained the age of 65 before the close of his taxable year.
3. An additional exemption of \$600 for the spouse of the taxpayer if the spouse has attained the age of 65 before the close of the taxable year, and has no income and is not the dependent of another taxpayer.
4. An additional exemption of \$600 for the taxpayer if he is blind at the close of his taxable year.
5. An additional exemption of \$600 for the spouse of the taxpayer if the spouse is blind at the close of the taxable year, and has no income and is not the dependent of another taxpayer.

Examination for Scientist Open

The examination for agricultural research scientist, grades P-2 to P-7, announced by the Civil Service Commission, August 10, 1948, is still open. If you hold a war service or temporary indefinite appointment in a position covered by this examination and have not applied to take it, file your application with Civil Service immediately. War service and temporary indefinite appointees will not be allowed to serve after the appropriate register is established. The options are listed in Civil Service Announcement No. 109.

Payroll Savings

Most of you are familiar with the plan for buying U. S. Savings Bonds through payroll deductions. To those who are not participating in the plan, this is a timely reminder of its advantages. There is no safer, surer investment today than U. S. Savings Bonds. The yield is excellent. Periodic savings can assure a future steady income for the education of your children, as a supplement to your retirement check, for travel, and many other things. Why not, through the payroll savings plan, have \$4 to spend 10 years from now for every \$3 you invest today? Ask the business officer of your Division for details.

Material for RESEARCH ACTIVITIES is reported by the following Division representatives: Agricultural Engineering, Jane Tuttrup; Cereals, Dr. S. C. Salmon; Cotton, C. B. Doyle; Forage, Ora Mae Means; Forest Pathology, Agnes Ellis; Fruit and Vegetables, H. R. Fulton; Mycology, Dr. Paul R. Miller; Nematology, Edna M. Buhrer; Plant Introduction, Dr. Donovan H. Correll; Rubber, Nina K. Shifflette; Soils and Fertilizers, W. W. Pate; Soil Survey, H. R. Smith; Sugar, Dr. George Sartoris; Tobacco, Dr. James McMurtrey jr.; Business Services, Edward H. Killen; Personnel, Elizabeth Bracey. The final report is compiled and written by Marguerite Gilstrap, Information.

PUBLICATIONS

Departmental

- Circular 773 Spoilage of Fresh Fruits and Vegetables in Rail Shipments Unloaded at New York City - 1935-42
- Circular 777 Water Input Used for Field Crops at the United States Scotts Bluff (Nebr.) Field Station, 1941 to 1944
- Circular 779 The Effect of Crop Rotation and Manure Upon the Yield and Quality of Sugar Beets, Scotts Bluff (Nebr.) Field Station, 1930-41
- Circular 782 Laboratory Gins and Tests of Reliability of Ginning with Different Sizes of Seed Cotton Lots
- Technical Bulletin 939 Inversion of Sucrose and Other Physiological Changes in Harvested Sugarcane in Louisiana
- Technical Bulletin 960 Leaf Rust of Wheat in the Uniform Rust Nurseries in the United States, 1938-43
- Soil Survey Umatilla Area, Oreg.
- Soil Survey Johnson County, Ind.
- Soil Survey Claiborne County, Tenn.
- Soil Survey Transylvania County, N. C.
- Soil Survey Tazewell County, Va.
- Soil Survey Jackson County, N. C.
- J.A.R. G-1390 Yield, Composition and Other Latex Characteristics of Grandiflora
- J.A.R. G-1391 Susceptibility of Verticillium Wilt of Guayule

Outside Articles Published in July and August

- Abbott, E. V., Summers, Eaton M., and Sartoris, G. B. Disease Testing and Seedling Selection Work at the Houma Station During 1947. Sug. Bul., August 1, 1948.
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- Jenkins, Anna E. The Swingle Sphaceloma Hand Lens and Early Records of the Pathogene of Citrus Scab. Mycologia, 1948
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- Meyer, James R. Modifications of Mitosis by Chemicals. Science, August 20, 1948.
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